

IN THE CLAIMS:

- 1 1. (CURRENTLY AMENDED) An intermediate network device having a plurality of
2 ports for sending and receiving network messages to and from one or more entities of a
3 computer network at least some of which are segregated into a plurality of virtual local
4 area network (VLANs) defined within the computer network, the intermediate network
5 device comprising:
6 a compact-Generic Application Registration Protocol (GARP) VLAN Registra-
7 tion Protocol (GVRP) application component associated with a selected port, the com-
8 pact-GVRP application component having:
9 a GARP Information Declaration (GID) component configured to main-
10 tain VLAN registration state for the selected port in response to receiving attribute
11 events for the VLANs;
12 a compact-GVRP encoder/decoder unit; and
13 | a GVRP protocol data unit (PDU) message generator, wherein
14 the compact-GVRP encoder/decoder unit is configured to compute encoded val-
15 ues, in accordance with an encoding algorithm that encodes a plurality of attribute events
16 that are each associated with a different VLAN of a given set of VLANs into each en-
17 coded value, and
18 the GVRP PDU message generator loads the encoded values computed for all of
19 the VLANs defined within the computer network within a single GVRP PDU message
20 for transmission from the selected port.
- 1 2. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 1
2 wherein the encoding algorithm is a number base conversion algorithm.
- 1 3. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 2
2 wherein the number base conversion algorithm is

3 $((((E_X \times 5 + E_{X+1}) \times 5 + E_{X+2}) \times 5 + E_{X+3}) \times 5 + E_{X+4}) \times 5 + E_{X+5})$ and wherein E_X corre-
4 sponds to the attribute event for the first VLAN in the set, E_{X+1} corresponds to the attrib-
5 ute event for the second VLAN in the set, E_{X+2} corresponds to the attribute event for the
6 third VLAN in the set, E_{X+3} corresponds to the attribute event for the fourth VLAN in the
7 set, E_{X+4} corresponds to the attribute event for the fifth VLAN in the set, and E_{X+5} corre-
8 sponds to the attribute event for the sixth VLAN in the set.

1 4. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 1
2 wherein the compact-GVRP encoder/decoder unit is configured to decode an encoded
3 value contained in a compact-GVRP PDU message, that was encoded using the encoding
4 algorithm, to yield attribute event information for a set of VLANs.

1 5. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 1
2 wherein the compact-GVRP application component is configured to generate and send a
3 GVRP PDU message containing a just_kidding message.

1 6. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 5
2 further comprising:
3 a leave timer;
4 a just_kidding timer; and
5 a just_kidding state machine,
6 wherein the just_kidding state machine is configured to start the leave timer and
7 to restart the just_kidding timer upon sending the GVRP PDU message containing the
8 just_kidding message.

1 7. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 6
2 comprising:
3 a leave_all timer; and

4 a leave_all state machine,
5 wherein the leave_all state machine is configured to enter an active state upon
6 sending the GVRP PDU message containing the just_kidding message and the compact-
7 GVRP application component is configured to generate and send a GVRP PDU message
8 that is configured to cause network entities that receive it to respond with one or more
9 GVRP PDU messages.

1 8. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 7
2 wherein the leave timer is set to a high value relative to the leave_all timer.

1 9. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim 7
2 comprising:

3 a mode selection unit configured to be in one of a compatible mode, a fast com-
4 pact mode or a slow compact mode,

5 wherein the mode selection unit is configured to enter the compatible mode if af-
6 ter the compact-GVRP application component sends the GVRP PDU message containing
7 a just_kidding message and the mode selection unit is either in the fast compact mode or
8 the slow compact mode and the compact-GVRP application component receives a con-
9 ventional GVRP PDU message.

1 10. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim
2 7 comprising:

3 a port partner variable configured to hold a source identifier,

4 wherein the compact-GVRP application component is configured to place the
5 source identifier in the port partner variable upon processing a received GVRP PDU mes-
6 sage containing a negotiation message with a source identifier.

1 11. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim
2 10 wherein the compact-GVRP application is configured to enter a slow compact mode
3 upon processing a received GVRP PDU message containing a negotiation message with a
4 source identifier that does not match the content of the port partner variable.

1 12. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim
2 10 wherein the compact-GVRP application is configured to enter a fast compact mode
3 upon processing a received GVRP PDU message containing a negotiation message with a
4 source identifier that matches the content of the port partner variable.

1 13. (PREVIOUSLY PRESENTED) An intermediate network device as defined in claim
2 1 wherein the compact-GVRP application component is configured to generate a mixed
3 format GVRP PDU message containing a conventional attribute structure as well as fields
4 loaded with the encoded values.

1 14. (CURRENTLY AMENDED) In an intermediate node having a plurality of ports for
2 sending and receiving network messages to and from one or more entities of a computer
3 network at least some of which are segregated into a plurality of virtual local area net-
4 work (VLANs) defined within the computer network, a method for conveying VLAN
5 membership information comprising the steps of:

6 for a given set of VLANs defined within the computer network, computing an en-
7 coded value, in accordance with an encoding algorithm that encodes a plurality of attrib-
8 ute events that are each associated with a different VLAN of the given set of VLANs
9 into the encoded value; and

10 loading encoded values for all of the VLANs defined within the computer net-
11 | work into a single GVRP protocol data unit (PDU) message for transmission at one or
12 more ports in the plurality of ports.

1 15. (PREVIOUSLY PRESENTED) A method as defined in claim 14 further comprising
2 the step of:

3 decoding an encoded value, that was encoded using the encoding algorithm and is
4 contained in a compact-GVRP PDU message, to yield attribute event information for a
5 set of VLANs.

1 16. (PREVIOUSLY PRESENTED) A method as defined in claim 14 further comprising
2 the steps of:

3 generating a GVRP PDU message containing a just_kidding message;
4 sending the GVRP PDU message containing the just kidding message out one or
5 more ports of the plurality of ports; and
6 restarting a just_kidding timer.

1 17. (PREVIOUSLY PRESENTED) A method as defined in claim 16 further comprising
2 the step of:

3 entering a slow compact mode upon the expiration of the just_kidding timer and
4 the non-receipt of a conventional GVRP PDU message.

1 18. (PREVIOUSLY PRESENTED) A method as described in claim 16 further compris-
2 ing the steps of:

3 entering one of a slow compact mode or a fast compact mode;
4 receiving a conventional GVRP PDU message; and
5 reverting to a compatible mode.

1 19. (PREVIOUSLY PRESENTED) A method as defined in claim 14 comprising the
2 steps of:

3 receiving a first compact-GVRP PDU message wherein the first compact-GVRP
4 PDU message contains a first source identifier.

1 20. (PREVIOUSLY PRESENTED) A method as defined in claim 19 comprising the
2 steps of:
3 receiving a second compact-GVRP PDU message wherein the second compact-
4 GVRP PDU message contains a second source identifier that does not match the first
5 source identifier; and
6 entering a slow compact mode.

1 21. (PREVIOUSLY PRESENTED) A method as defined in claim 19 comprising the
2 steps of:
3 receiving a second compact-GVRP PDU message wherein the second compact-
4 GVRP PDU message contains a second source identifier that matches the first source
5 identifier; and
6 entering a fast compact mode.

1 22. (CURRENTLY AMENDED) An apparatus having a plurality of ports for sending
2 and receiving network messages to and from one or more entities of a computer network
3 at least some of which are segregated into a plurality of virtual local area network
4 (VLANs) defined within the computer network, the apparatus comprising:
5 means for maintaining VLAN registration state for a selected port in response to
6 receiving attribute events for the VLANs;
7 means for computing an encoded value, in accordance with an encoding algorithm
8 that encodes a plurality of attribute events that are each associated with a different VLAN
9 of a given set of VLANs into the encoded value;
10 means for loading encoded values for all of the VLANs defined within the com-
11 puter network into a single GVRP protocol data unit (PDU) message for transmission
12 from a port in the plurality of ports.

1 23. (CURRENTLY AMENDED) A computer readable medium comprising computer
2 executable instructions for:

3 computing an encoded value, in accordance with an encoding algorithm that en-
4 codes a plurality of, attribute events that are each associated with a different VLAN of a
5 given set of VLANs into the encoded values; and
6 loading encoded values for all of the VLANs defined within the computer net-
7 | work into a single GVRP protocol data unit (PDU) message for transmission from a port
8 in the plurality of ports.

1 24. (NEW) A method comprising:

2 maintaining virtual local area network (VLAN) registration state at a port of an
3 intermediate network device in a computer network, where a plurality of VLANs are de-
4 fined within the computer network;

5 grouping the plurality of VLANs defined within the computer network into sets of
6 two or more different VLANs;

7 for each set of two or more different VLANs, computing an encoded value with
8 an encoding algorithm that encodes attribute events associated with each VLAN of the
9 two or more different VLANs of the set into a single encoded value for the set; and

10 loading each encoded value into a respective field of a VLAN registration proto-
11 col message such that encoded values encompassing all of the VLANs defined within the
12 computer network are included within the VLAN registration protocol message; and

13 transmitting the VLAN registration protocol message including the encoded val-
14 ues encompassing all of the VLANs defined within the computer network from the in-
15 termediate network device to one or more other network devices within the computer
16 network.

1 25. (NEW) A method as defined in claim 24 wherein the plurality of VLANs defined
2 within the computer network includes more than 373 different VLANs.

1 26. (NEW) A method as defined in claim 24 wherein the plurality of VLANs defined
2 within the computer network includes at least 4094 different VLANs.

1 27. (NEW) The intermediate network device as defined in claim 1 wherein the VLANs
2 defined within the computer network include more than 373 different VLANs.

1 28. (NEW) A method as defined in claim 14 wherein the VLANs defined within the
2 computer network include more than 373 different VLANs.